

Application Serial No. 09/469,496  
Amendment dated 23 October 2003  
Further to Response filed on 30 April 2003

*AMENDMENTS TO THE CLAIMS*

This Listing of Claims will replace all prior versions, including listings, of claims in the application.

*Listing of Claims*

Claim 1 (original): A substantially pure conotoxin which is highly selective for a specific human receptor, which conotoxin is selected from the group consisting of:

Gly-Xaa-Ser-Phe-Cys-Lys-Ala-Asp-Glu-Lys-Xaa-Cys-Glu-Tyr-His-Ala-Asp-Cys-Cys-Asn-Cys-Cys-Leu-Ser-Gly-Ile-Cys-Ala-Xaa-Ser-Thr-Asn-Trp-Ile-Leu-Pro-Gly-Cys-Ser-Thr-Ser-Ser-Phe-Phe-Lys-Ile (SEQ ID NO:7) wherein Xaa is 4Hyp;

Gly-Cys-Cys-Ser-His-Pro-Ala-Cys-Ser-Gly-Lys-Tyr-Gln-Xaa-Tyr-Cys-Arg-Xaa-Ser (SEQ ID NO:8) wherein Xaa is Gla and the C-terminus is amidated;

His-Xaa-Xaa-Cys-Cys-Leu-Tyr-Gly-Lys-Cys-Arg-Arg-Tyr-Xaa-Gly-Cys-Ser-Ser-Ala-Ser-Cys-Cys-Gln (SEQ ID NO:9) wherein Xaa is 4Hyp;

Cys-Lys-Thr-Tyr-Ser-Lys-Tyr-Cys-Xaa-Ala-Asp-Ser-Xaa-Cys-Cys-Thr-Xaa-Gln-Cys-Val-Arg-Ser-Tyr-Cys-Thr-Leu-Phe (SEQ ID NO:10) wherein Xaa is Gla and the C-terminus is amidated;

Ser-Thr-Ser-Cys-Met-Glu-Ala-Gly-Ser-Tyr-Cys-Gly-Ser-Thr-Thr-Arg-Ile-Cys-Cys-Gly-Tyr-Cys-Ala-Tyr-Phe-Gly-Lys-Cys-Ile-Asp-Tyr-Pro-Ser-Asn (SEQ ID NO:11);

Gly-Glu-Xaa-Xaa-Val-Ala-Lys-Met-Ala-Ala-Xaa-Leu-Ala-Arg-Xaa-Asn-Ile-Ala-Lys-Gly-Cys-Lys-Val-Asn-Cys-Tyr-Pro (SEQ ID NO:12) wherein Xaa is Gla; and

Glu-Ser-Glu-Glu-Gly-Ser-Asn-Ala-Thr-Lys-Lys-Pro-Tyr-Ile-Leu (SEQ ID NO:13), wherein Glu in the 1-position is pGlu and the C-terminus is amidated.

Claim 2 (original): A conotoxin according to claim 1 having the formula:

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Gly-Xaa-Ser-Phe-Cys-Lys-Ala-Asp-Glu-Lys-Xaa-Cys-Glu-Tyr-His-Ala-Asp-Cys-Cys-Asn-Cys-Cys-Leu-Ser-Gly-Ile-Cys-Ala-Xaa-Ser-Thr-Asn-Trp-Ile-Leu-Pro-Gly-Cys-Ser-Thr-Ser-Ser-Phe-Phe-Lys-Ile (SEQ ID NO:7) wherein Xaa is 4Hyp.

Claim 3 (original): A conotoxin according to claim 1 having the formula:

Gly-Cys-Cys-Ser-His-Pro-Ala-Cys-Ser-Gly-Lys-Tyr-Gln-Xaa-Tyr-Cys-Arg-Xaa-Ser (SEQ ID NO:8) wherein Xaa is Gla and the C-terminus is amidated.

Claim 4 (original): A conotoxin according to claim 1 having the formula:

His-Xaa-Xaa-Cys-Cys-Leu-Tyr-Gly-Lys-Cys-Arg-Arg-Tyr-Xaa-Gly-Cys-Ser-Ser-Ala-Ser-Cys-Cys-Gln (SEQ ID NO:9) wherein Xaa is 4Hyp.

Claim 5 (original): A conotoxin according to claim 1 having the formula:

Cys-Lys-Thr-Tyr-Ser-Lys-Tyr-Cys-Xaa-Ala-Asp-Ser-Xaa-Cys-Cys-Thr-Xaa-Gln-Cys-Val-Arg-Ser-Tyr-Cys-Thr-Leu-Phe (SEQ ID NO:10) wherein Xaa is Gla and the C-terminus is amidated.

Claim 6 (original): A conotoxin according to claim 1 having the formula:

Ser-Thr-Ser-Cys-Met-Glu-Ala-Gly-Ser-Tyr-Cys-Gly-Ser-Thr-Thr-Arg-Ile-Cys-Cys-Gly-Tyr-Cys-Ala-Tyr-Phe-Gly-Lys-Lys-Cys-Ile-Asp-Tyr-Pro-Ser-Asn (SEQ ID NO:11).

Claim 7 (original): A conotoxin according to claim 1 having the formula:

Gly-Glu-Xaa-Xaa-Val-Ala-Lys-Met-Ala-Ala-Xaa-Leu-Ala-Arg-Xaa-Asn-Ile-Ala-Lys-Gly-Cys-Lys-Val-Asn-Cys-Tyr-Pro (SEQ ID NO:12) wherein Xaa is Gla.

Claim 8 (original): A conotoxin according to claim 1 having the formula:

Glu-Ser-Glu-Glu-Gly-Gly-Ser-Asn-Ala-Thr-Lys-Lys-Pro-Tyr-Ile-Leu (SEQ ID NO:13), wherein Glu in the 1-position is pGlu and the C-terminus is amidated.

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Claim 9 (original): The conotoxin according to claim 8 wherein the Thr residue is glycosylated.

Claim 10 (previously presented). A substantially pure conotoxin having the amino acid sequence Glu-Ser-Glu-Glu-Gly-Ser-Asn-Ala-Thr-Lys-Lys-Pro-Tyr-Ile-Leu (SEQ ID NO:13), wherein Glu in the 1-position is pGlu.

Claim 11 (previously presented). The substantially pure conotoxin of claim 10, wherein the Thr residue is glycosylated.

Claim 12 (new): An isolated conotoxin which is highly selective for a specific human receptor, comprising a conotoxin selected from the group consisting of:

Gly-Xaa-Ser-Phe-Cys-Lys-Ala-Asp-Glu-Lys-Xaa-Cys-Glu-Tyr-His-Ala-Asp-Cys-Cys-Asn-Cys-Cys-Leu-Ser-Gly-Ile-Cys-Ala-Xaa-Ser-Thr-Asn-Trp-Ile-Leu-Pro-Gly-Cys-Ser-Thr-Ser-Ser-Phe-Phe-Lys-Ile (SEQ ID NO:7) wherein Xaa is 4Hyp;

Gly-Cys-Cys-Ser-His-Pro-Ala-Cys-Ser-Gly-Lys-Tyr-Gln-Xaa-Tyr-Cys-Arg-Xaa-Ser (SEQ ID NO:8) wherein Xaa is Gla and the C-terminus is amidated;

His-Xaa-Xaa-Cys-Cys-Leu-Tyr-Gly-Lys-Cys-Arg-Arg-Tyr-Xaa-Gly-Cys-Ser-Ser-Ala-Ser-Cys-Cys-Gln (SEQ ID NO:9) wherein Xaa is 4Hyp;

Cys-Lys-Thr-Tyr-Ser-Lys-Tyr-Cys-Xaa-Ala-Asp-Ser-Xaa-Cys-Cys-Thr-Xaa-Gln-Cys-Val-Arg-Ser-Tyr-Cys-Thr-Leu-Phe (SEQ ID NO:10) wherein Xaa is Gla and the C-terminus is amidated;

Ser-Thr-Ser-Cys-Met-Glu-Ala-Gly-Ser-Tyr-Cys-Gly-Ser-Thr-Thr-Arg-Ile-Cys-Cys-Gly-Tyr-Cys-Ala-Tyr-Phe-Gly-Lys-Cys-Ile-Asp-Tyr-Pro-Ser-Asn (SEQ ID NO:11);

Gly-Glu-Xaa-Xaa-Val-Ala-Lys-Met-Ala-Ala-Xaa-Leu-Ala-Arg-Xaa-Asn-Ile-Ala-Lys-Gly-Cys-Lys-Val-Asn-Cys-Tyr-Pro (SEQ ID NO:12) wherein Xaa is Gla; and

Glu-Ser-Glu-Glu-Gly-Ser-Asn-Ala-Thr-Lys-Lys-Pro-Tyr-Ile-Leu (SEQ ID NO:13), wherein Glu in the 1-position is pGlu and the C-terminus is amidated.

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Claim 13 (new): The conotoxin according to claim 12 comprising the formula:

Gly-Xaa-Ser-Phe-Cys-Lys-Ala-Asp-Glu-Lys-Xaa-Cys-Glu-Tyr-His-Ala-Asp-Cys-Cys-Asn-Cys-Cys-Leu-Ser-Gly-Ile-Cys-Ala-Xaa-Ser-Thr-Asn-Trp-Ile-Leu-Pro-Gly-Cys-Ser-Thr-Ser-Ser-Phe-Phe-Lys-Ile (SEQ ID NO:7) wherein Xaa is 4Hyp.

Claim 14 (new): The isolated conotoxin according to claim 12 comprising the formula:

Gly-Cys-Cys-Ser-His-Pro-Ala-Cys-Ser-Gly-Lys-Tyr-Gln-Xaa-Tyr-Cys-Arg-Xaa-Ser (SEQ ID NO:8) wherein Xaa is Gla and the C-terminus is amidated.

Claim 15 (new): The isolated conotoxin according to claim 12 comprising the formula:

His-Xaa-Xaa-Cys-Cys-Leu-Tyr-Gly-Lys-Cys-Arg-Arg-Tyr-Xaa-Gly-Cys-Ser-Ser-Ala-Ser-Cys-Cys-Gln (SEQ ID NO:9) wherein Xaa is 4Hyp.

Claim 16 (new): The isolated conotoxin according to claim 12 comprising the formula:

Cys-Lys-Thr-Tyr-Ser-Lys-Tyr-Cys-Xaa-Ala-Asp-Ser-Xaa-Cys-Cys-Thr-Xaa-Gln-Cys-Val-Arg-Ser-Tyr-Cys-Thr-Leu-Phe (SEQ ID NO:10) wherein Xaa is Gla and the C-terminus is amidated.

Claim 17 (new): The isolated conotoxin according to claim 12 comprising the formula:

Ser-Thr-Ser-Cys-Met-Glu-Ala-Gly-Ser-Tyr-Cys-Gly-Ser-Thr-Thr-Arg-Ile-Cys-Cys-Gly-Tyr-Cys-Ala-Tyr-Phe-Gly-Lys-Lys-Cys-Ile-Asp-Tyr-Pro-Ser-Asn (SEQ ID NO:11).

Claim 18 (new): The isolated conotoxin according to claim 12 comprising the formula:

Gly-Glu-Xaa-Xaa-Val-Ala-Lys-Met-Ala-Ala-Xaa-Leu-Ala-Arg-Xaa-Asn-Ile-Ala-Lys-Gly-Cys-Lys-Val-Asn-Cys-Tyr-Pro (SEQ ID NO:12) wherein Xaa is Gla.

Claim 19 (new): The isolated conotoxin according to claim 12 comprising the formula:

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Glu-Ser-Glu-Glu-Gly-Gly-Ser-Asn-Ala-Thr-Lys-Lys-Pro-Tyr-Ile-Leu (SEQ ID NO:13),  
wherein Glu in the 1-position is pGlu and the C-terminus is amidated.

Claim 20 (new): The isolated conotoxin according to claim 19 wherein the Thr residue is glycosylated.

Claim 21 (new). An isolated conotoxin comprising the amino acid sequence Glu-Ser-Glu-Glu-Gly-Gly-Ser-Asn-Ala-Thr-Lys-Lys-Pro-Tyr-Ile-Leu (SEQ ID NO:13), wherein Glu in the 1-position is pGlu.

Claim 22 (new). An isolated conotoxin comprising the amino acid sequence Glu-Ser-Glu-Glu-Gly-Gly-Ser-Asn-Ala-Thr-Lys-Lys-Pro-Tyr-Ile-Leu (SEQ ID NO:13), wherein Glu in the 1-position is pGlu and the Thr residue is glycosylated.